intellimeter CANADA INC.
Innovative Metering Solutions

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TX-2005A Series Meters

– Installation Manual –

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INDEX

Part One 3

1. Measurement Canada Requirements 3

Part Two 4

2. Metering Rules 4

Part Three 5

3. Installation Instructions: 5

Part Four 6

4. Service Types: 6

Part Five 7

5. CT Wiring and Lengths: 7

Part Six 8

6. LED Indicators: 8

Part Seven 9

7. Communication Cable: 9

Part Eight 10

8. Pre Site Visit Check List 10

Appendix 10

Typical Layout TX-2005A Configurations 11

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Part One

1. Measurement Canada Requirements

Measurement Canada
Notice to all Electrical Contractors and Owners

(Applies to milli-Amp type CT's only)

This is to inform the electrical contractors who are installing any static type metering system that Current Transformers (CT's) are assigned to a specific meter and are required to stay with that meter.

Any CT's that are not installed on the meter assigned and sealed with will void the meters seal and be considered a non-legal billing meter.

On the side of the CT's, the serial number of the meter and the potential line is indicated as a guide for the contractor.

FOLLOW THE INSTALLATION DRAWINGS!

Match the CT's with the meter, and install them on the correct line to the correct phase.
If there are any differences with the drawings compared to your distribution panel,

CALL US IMMEDIATELY!

CAUTION:

Phasing and CT installation are very important. If the metering system is not installed according to the installation drawings, the system will not work and any cost in correcting the installation by Intellimeter will be charged back to the installer / developer.

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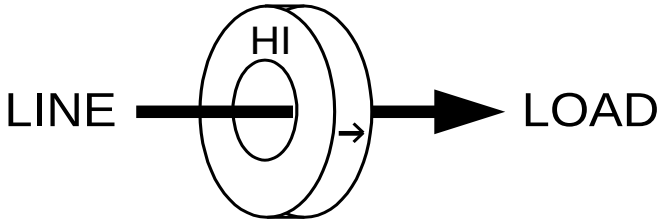
Part Two

2. Metering Rules

#1. *Current Transformers (CT's) are directional*.
#2. Voltage references must be in phase with the load being metered and from the same source.
#3. CT's (milli-Amp) are certified to an assigned meter and to the meters assigned phase.

Rule #1:

If the CT's are mounted in the opposite direction, the polarity of the CT will be opposite.
The arrow on the CT indicates the direction from LINE to LOAD.



Similarly, the **"H1"** is on the LINE SIDE.

All Intellimeter's milli-Amp current transformers 200:0.1A (2000:1), and 400:0.1A (4000:1) have self-shorting protection built into the device. They can safely be open circuited while under load.

All 5 Amp (X00: 5A) Type Instrument Transformers Do Not Have This Protection And Are Required To Be Shorted Together While Under Load At All Times.

Rule #2:

Check to verify that the voltage potential used, as a reference voltage, is the same phasing as the loads being metered. ABC is ABC not CBA. The reference voltage must come from the same source. Voltage reference from another transformer is incorrect and causes inaccurate readings.

Connect the voltage reference to the meters disconnect or terminals making sure it is the same phase sequence.

Usually:

Line 1 = Red or 'A' phase
Line 2 = Black or 'B' phase
Line 3 = Blue or 'C' phase
Neutral = White

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***Rule #3*:** (Intellimeter milliamp current transformers 200:0.1A and 400:0.1A only)

When the metering system was tested at the factory, the CT's were assigned to a meter and to a specific element of that meter. Under Measurement Canada regulation for electronic static sub-metering, the CT's must be installed and used only with the meter and element that it was certified with.
We have identified each CT so it can be easily installed following the installation drawing that was designed for that particular distribution.
Follow the Installation Drawing! If there is a discrepancy with the drawing in comparison to your distribution panel, call us for assistance.

For all 5Amp type Instrument Transformers, make sure you identify the phase that it was installed on for proper connection at the meter terminal block.

PLEASE CALL IF ANYTHING IS NOT CLEAR. IT IS DIFFICULT TO CORRECT ERRORS ONCE INSTALLATION HAS BEEN COMPLETED!
Technical Assistance: 905-839-9199

Part Three

3. Installation Instructions:

These installation instructions are generic for both types of multi-customer sub-metering systems. Again, call before you install if you require additional information on this process. If any of these steps are incorrect, call for assistance.

1. Confirm the drawings that were sent with the metering system are accurate. Verify the type of panel and that the distribution is the same. It is important that all assigned breaker phasing is correct.
2. Assign the proper panel to the identified distribution.
3. Verify the number of loads is the same as the number of meters.
4. Verify the type of system is the same as the meters supplied, (Ex. 120/208V, 100A or 200A, 3 phase 4 wire, single phase 3 wire network system, etc).
5. Mount the panel as indicated by the drawing. Call to inquire if a different mounting configuration would work better.
6. Refer to the drawings to sort out the CT's to be installed on the load feeders.
7. One feeder at a time, install the CT's so the arrow is pointing towards the load. Confirm on the drawing, the installed CT corresponds to the correct phase of the suite. Continue until all CT's are installed.

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8. Supply a voltage reference from the distribution panel. Depending on the configuration, minimum is a 15A breaker and the number of phases should match what is required on the drawing.
9. If the system is automated, a CAT 5, 4 pair #24 (Network cable) is required to be pulled from one metering panel to the next until it reaches the communication cabinet that is usually mounted in the communication room or main electrical room. Refer to single line drawing.
10. **Attached is a checklist that is to be completed, verified and faxed back to Intellimeter before commissioning is scheduled.**

NOTE: The electrical contractor will provide an electrician for the duration of the commissioning for inspection and for any modification re-work required. Intellimeter is not liable to work on the electrical distribution and will only be terminating the communication lines. All deficiencies will be recorded and sent to the electrical contractor for correction before returning to site.

Part Four

4. Service Types:

- Single Phase 2Wire (120)
  Line 1 = CT1

- Single Phase 3 Wire (120/240)
  Line 1 = CT1
  Line 2 = CT2

- Network Two Phase Three Wire (120/208) - (3 sets) Typical Colour Code
  Line 1 = CT1 = A phase = Red
  Line 2 = CT2 = B phase = Black
  &
  Line 1 = CT1 = C phase = Blue
  Line 2 = CT2 = A phase = Red
  &
  Line 1 = CT1 = B phase = Black
  Line 2 = CT2 = C phase = Blue

***** If the load is on B & C phase, Line 1 (CT1) is on B phase and Line 2 (CT2) is on C phase.
This staggering of phasing is to match the typical three-phase four-wire distribution panel for 2 phase loads.

Three Phase Meter Typical (120/208, 277/480, 347/600) Colour Code

(Continued on next page)

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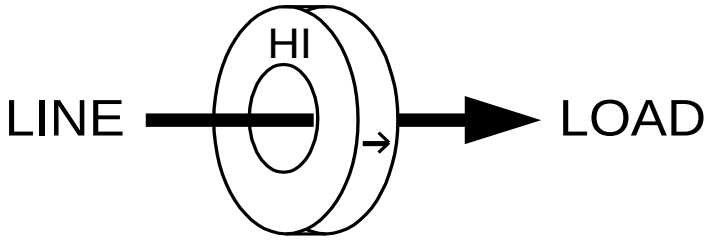
Line 1 = CT1 = A phase = Red / Orange
Line 2 = CT2 = B phase = Black / Brown
Line 3 = CT3 = C phase = Blue / Yellow

Part Five

5. CT Wiring and Lengths:

Current Transformers (CT's) are directional (→). An arrow points to the load or "H1" indicates Line Side.



Typical: Install CT1 on Line 1 (Red), CT2 on Line2 (Black), and CT3 on Line3 (Blue).
Refer to "Service Types" above for your system.

External Current Transformers (CT's) Twisted Pair #18-14 stranded colour code

#1	**Intellimeter CT's 200A (Yellow)**	**White (+) Black (-)**
#2	**Intellimeter CT's 400A (Black)**	**Yellow / Black trace (+) Yellow (-)**
#3	**Instrument Transformers (CT's) (All X00: 5A Type)**	**White (+) = X1 Black (-) = X2**

The maximum length the CT leads can be extended is 400 feet for #1 & #2 and 50 feet only for #3. 1 twisted pair wire only for each CT.
Intellimeter CT's: <50ft = #18 minimum
>50 to <150ft = #16 minimum
>150 to 250ft = #14 minimum
>250 to 400ft = #12 minimum
Instrument CT's: #14 minimum

Identify the polarity and the phase the CT is installed on for proper termination. **Always identify all wires**.

Refer to installation drawings and terminal labels for polarity and connection.

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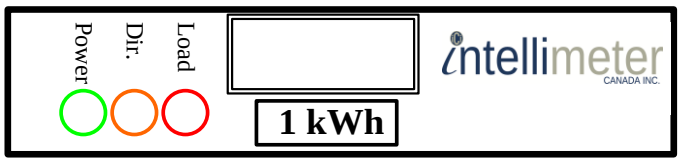
Part Six

6. LED Indicators:



Dir LEDs: When OFF, it indicates CT is installed correctly.
When ON (Orange), CT is installed backwards, majority of load is in the negative direction, or phasing is incorrect. Re-verify the installation.

LOAD LEDs: Under load, this LED (Red) will pulse proportion to load. The more load the meter measures, the faster the pulsing. Refer to attach label for pulse rate (Ks).

POWER: This LED (Green) indicates power is ON.

Accuracy test:

(Referring to the LOAD LED pulse)
The TX meter has a LOAD LED (Red) that will allow the meter to register a pulse at attached label for pulse rate (Ks). This will enable you to determine the accuracy of the meter with a radian standard or to mathematically determine the time between pulses for a given load.

Voltage=Phase to Neutral
Amperage=SUM of all currents
1 / ((Voltage x Amperage) ÷ Ks ÷ 3600) = seconds per pulse

This is the time in seconds between pulses in test mode. Unless you have a fixed load, this is an approximate value.

Troubleshooting:

"LOAD" LED NOT ON or PULSING	- No load on service - CT's installed incorrectly - Phasing out of sequence CT's and phasing should be matched: CT1 on Line1, CT2 on Line2, and CT3 on Line3	- Apply some load - Refer to above wiring - Correct the install

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“DIR” LED ON	- Indicates the majority of the load is in the negative direction - CT is installed backwards, phasing is not correct	- Correct the CT installation - Refer to above installation directions
“POWER” LED NOT ON	- Power not connected or not ON. Line1 and Neutral required to power the meter.	- Verify the voltage reference is energised

Part Seven

7. Communication Cable:

Refer to the enclosed sheet for communication cable pathway, connection and termination configuration between all automation.

TX-2005A typically is used with PT2000. Refer to the PT2000 connection drawing for termination and specifications.

PT-2000 Serial Numbers range from 5000 +

For any additional installation and troubleshooting questions, please call and ask for technical help.

(905) 839-9199 – Technical Support

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Part Eight

8. Pre Site Visit Check List

	Description of Work	Yes / No	Tech:
1	All loads have been identified and confirmed at the distribution panels. **"Suite to Breaker Verification"**		
2	The installation drawings are accurate.		
3	All metering equipment installed.		
4	The voltage reference to metering board disconnect is pulled, connected, and energised.		
5	The voltage reference is in phase with the loads being metered. 'A' is 'A', 'B' is 'B', & 'C' is 'C' etc.		
6	All CT installation has been completed and confirmed that they are installed in the correct direction and installed accordingly to the installation drawing 100**%!**		
7	All suites or loads have been documented on the installation drawings.		
8	All communication cables (if applicable) are pulled accordingly to the single line drawing. (CAT5 cable)		
9	In each metering cabinet, the communication cable is identified and has enough length for proper termination.		
10	The communication cabinet is mounted in designated area and a 120VAC, 15A circuit is assigned to it.		
11	A communication cable (CAT5) from the communication cabinet to an internet connection is supplied for remote communication.		
12	The metering panels are all energised and working.		
13	There should be no ORANGE light illuminated. This would indicate a reverse load and would need to be investigated. (Page 10).		

Job Name:	Job #:	Date:

Company:		Office Number:	
Forman:		Site Number:	
Signature:			
Date Requesting for Site Visit:			

Intellimeter Canada Service Department: Phone: 905-839-9199, Fax: 905-839-9198

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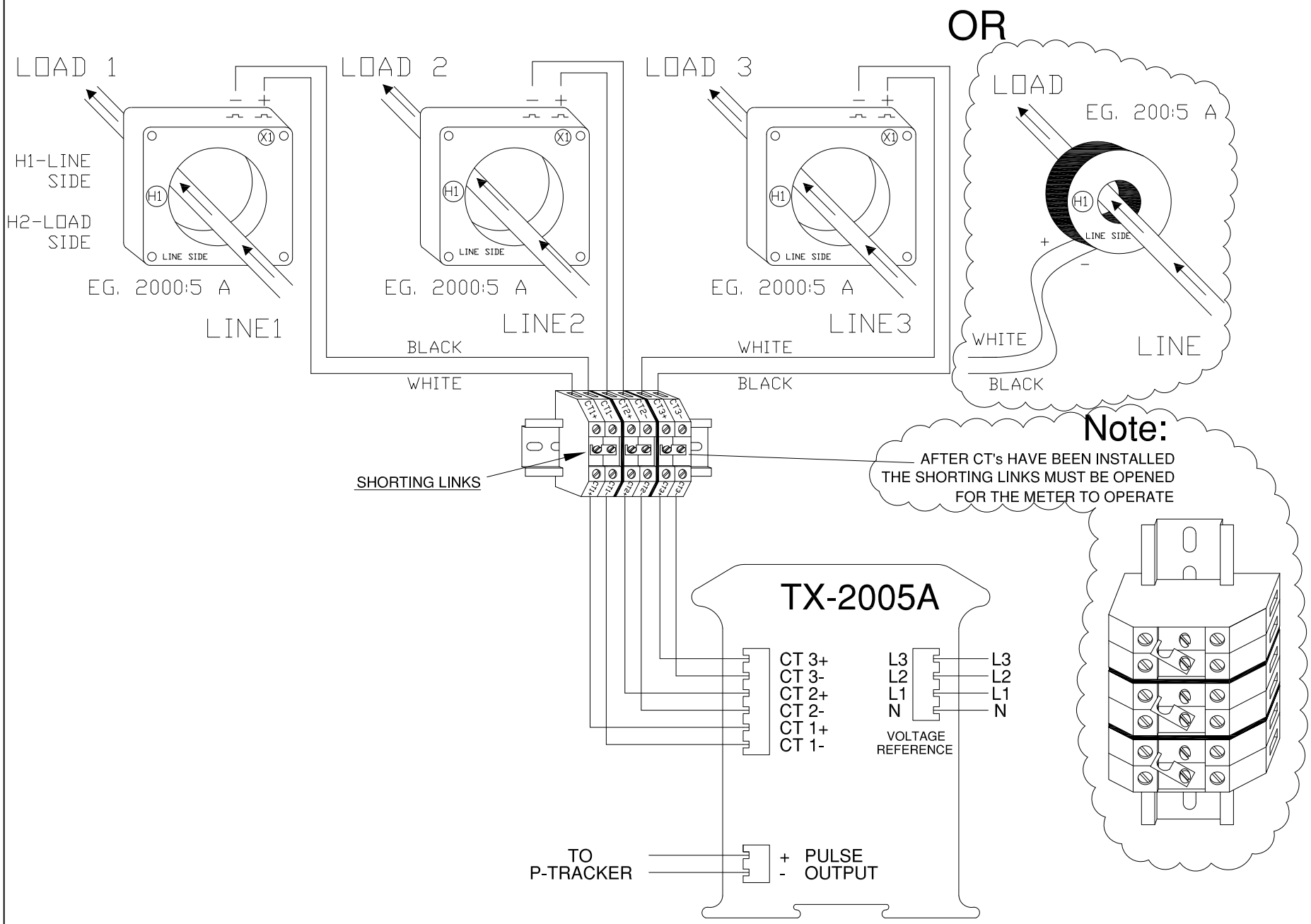
WIRING DIAGRAM FOR INSTRUMENT CURRENT TRANSFORMER,SHORTING BLOCK AND TX-2005A METER



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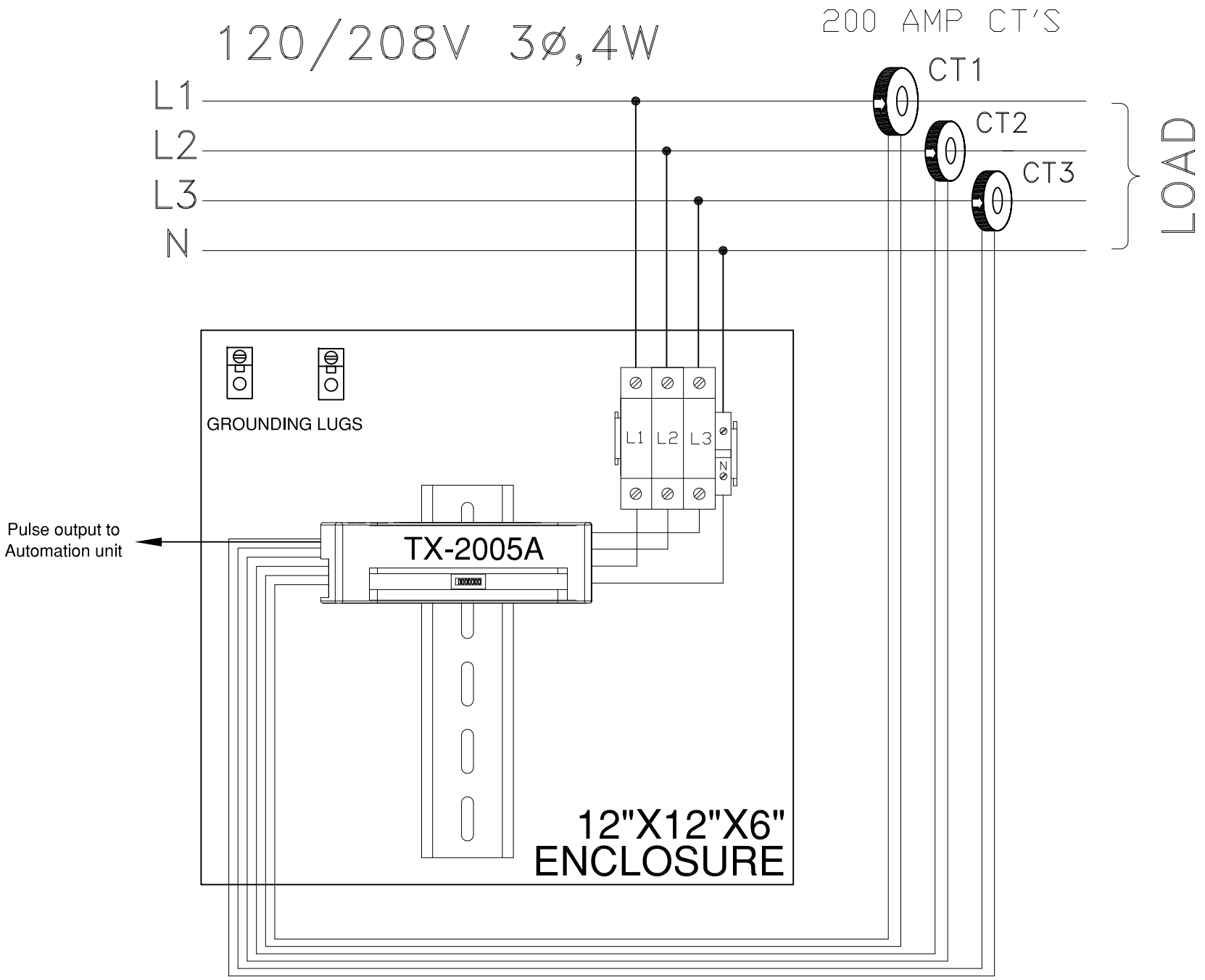
Project Name:	
Distributor:	
Engineer:	
P.O.#	XXX
Contractor:	
Date:	Rev.
Project #:	
Drawing #:	
Drawn:	H.P.
Checked:	H.P.
Drawing:	20 Turn CT's

TX-2005A METERING SYSTEM LAYOUT.
(TYPICAL)



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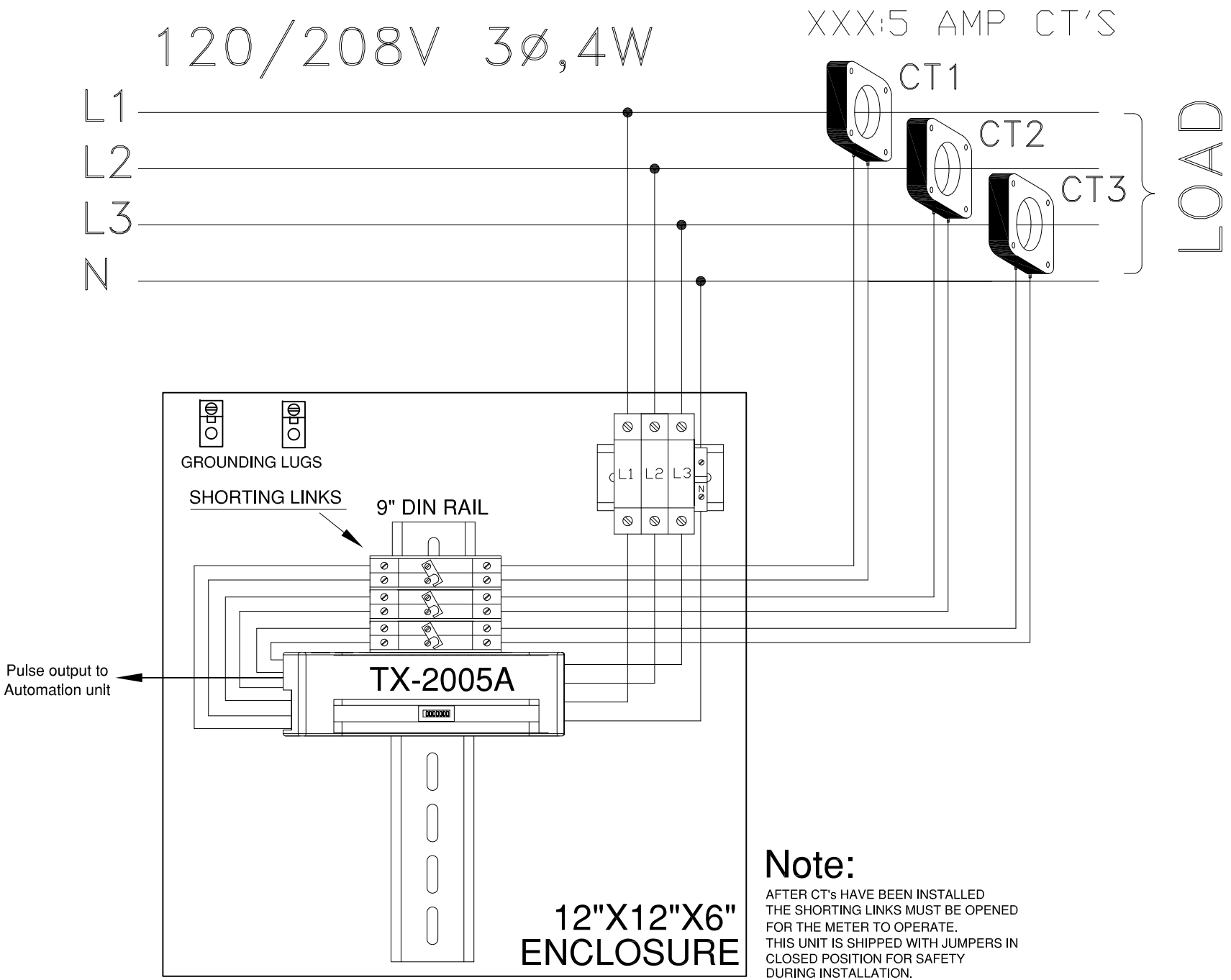
Distributor:	
Engineer:	
P.O.#	
Contractor:	
Date:	Rev.
Project #:	
Drawing #:	
Drawn:	
Checked:	
Drawing: TXA1202003	

TX-2005A METERING SYSTEM LAYOUT.

(TYPICAL)



Note:

AFTER CT's HAVE BEEN INSTALLED
THE SHORTING LINKS MUST BE OPENED
FOR THE METER TO OPERATE.
THIS UNIT IS SHIPPED WITH JUMPERS IN
CLOSED POSITION FOR SAFETY
DURING INSTALLATION.

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Project Name:

Distributor:

Engineer:

P.O.#

Contractor:

Date:	Rev.

Project #:

Drawing #:

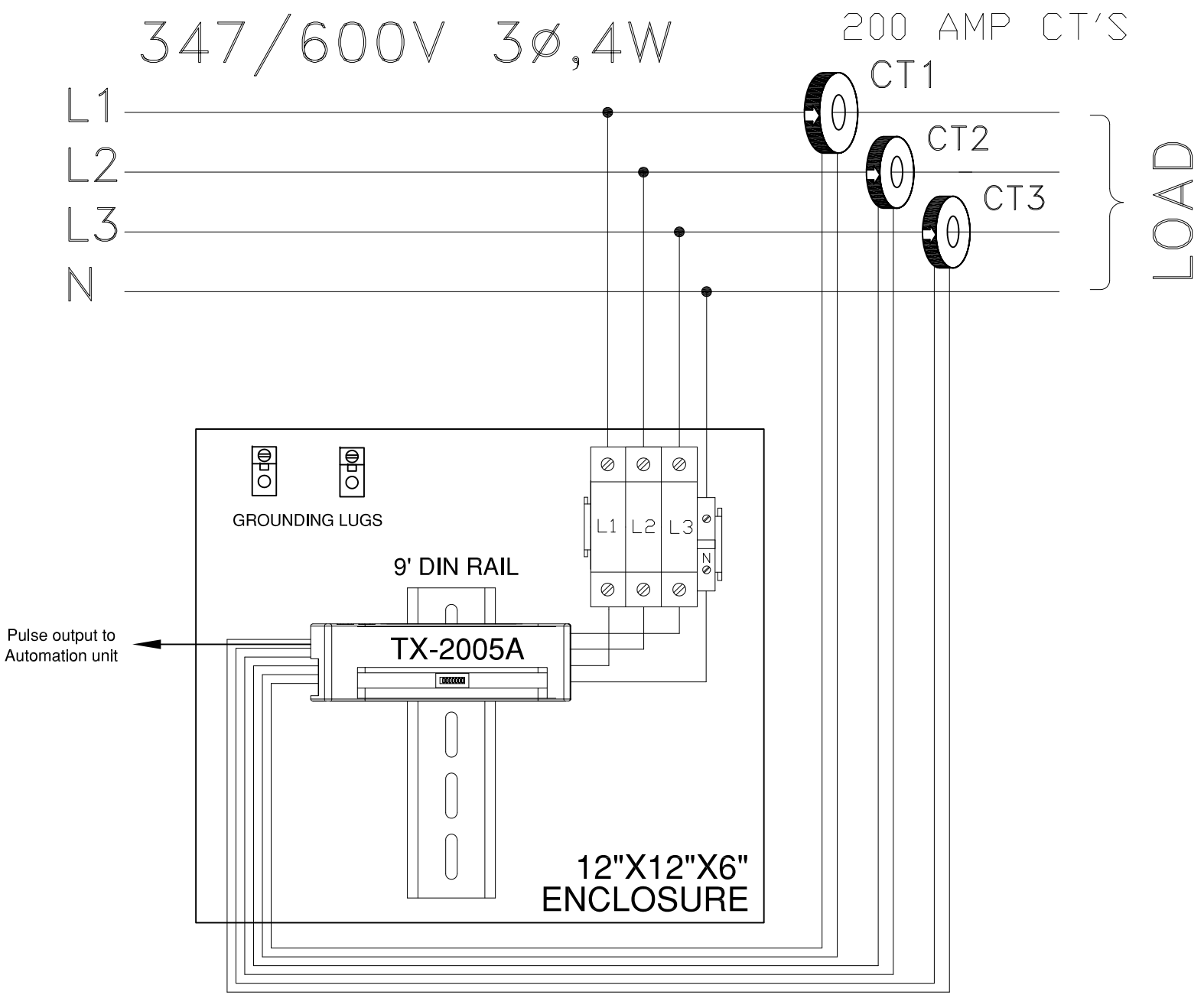
Drawn:

Checked:

Drawing:
TX1200103

TX-2005A METERING SYSTEM LAYOUT.

(TYPICAL)



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Project Name:	
Distributor:	
Engineer:	
P.O.#	
Contractor:	
Date:	Rev.
Project #:	
Drawing #:	
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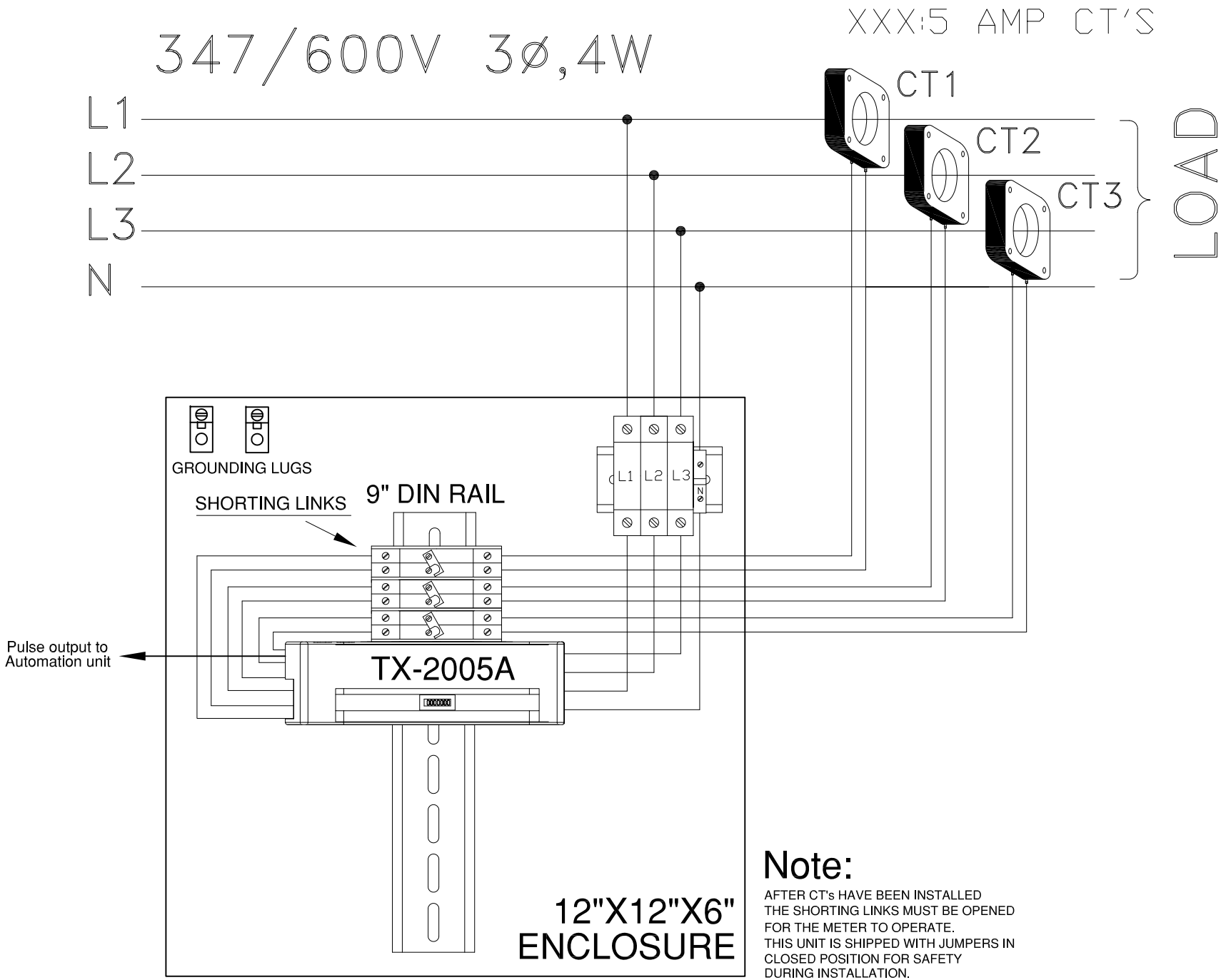
Drawing: TX3472003	

TX-2005A METERING SYSTEM LAYOUT.

(TYPICAL)



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Contractor:	
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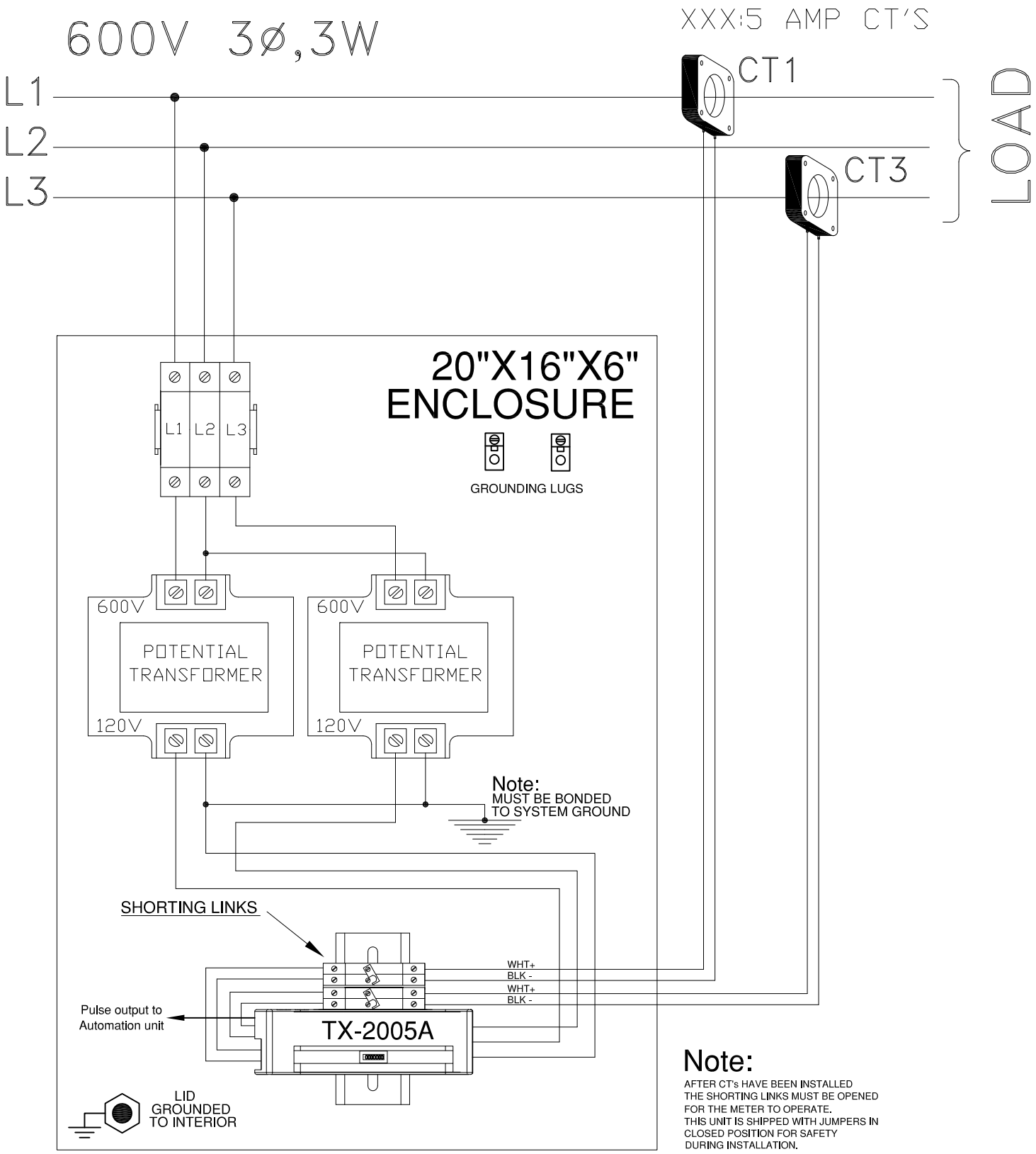
Drawing: TX3470103	

TX-2005A METERING SYSTEM LAYOUT.

(TYPICAL)



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										TXA1200102 (600V)